

**Supplemental Material**  
**Cumulative Lead Exposure and Age at Menopause in the  
Nurses' Health Study Cohort**

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**Supplemental Material, Table S1.** Difference (95% CI) in age at natural menopause (years) by tibia lead concentration.

Tibia lead tertiles (µg/g)		Difference (95% CI)
Model 1 <sup>a</sup>	< 6.5	Reference
	6.5-13	-0.80 (-1.67, 0.06)
	13+	-1.21 (-2.08, -0.35)
	<i>P</i> for trend test	0.006
Model 2 <sup>b</sup>	< 6.5	Reference
	6.5-13	-0.74 (-1.62, 0.14)
	13+	-1.33 (-2.22, -0.44)
	<i>P</i> for trend test	0.003
Model 3 <sup>c</sup>	< 6.5	Reference
	6.5-13	-0.62 (-1.64, -0.01)
	13+	-1.21 (-2.05, -0.37)
	<i>P</i> for trend test	0.005
Model 4 <sup>d</sup>	< 6.5	Reference
	6.5-13	-0.61 (-1.43, 0.21)
	13+	-1.05 (-1.88, -0.22)
	<i>P</i> for trend test	0.01
Model 5 <sup>e</sup>	< 6.5	Reference
	6.5-13	-0.74 (-1.71, 0.24)
	13+	-0.98 (-1.93, -0.02)
	<i>P</i> for trend test	0.05

<sup>a</sup>Default model used for main analysis; adjusted for substudy group, age at bone lead measure, age at bone lead measure squared, year of birth, age at menarche, months of oral contraceptive use, parity, and pack-years of smoking; n = 434. <sup>b</sup>Same as model 1 plus additional adjustment for BMI and alcohol consumption; n = 411. <sup>c</sup>Same as model 1 plus additional adjustment for hormone replacement therapy; n = 423. <sup>d</sup>Same as model 1, but restricted to women with menopause after 1976; n = 401. <sup>e</sup>Same as model 1, but restricted to women who were postmenopausal for more than 5 years before bone lead measurement; n = 321. *P* for trend was calculated using linear regression with a continuous lead biomarker term created by assigning each woman the median value of her lead biomarker tertile.

**Supplemental Material, Table S2.** Odds ratio (95% CI) for early menopause (< 45years) by tibia lead concentration.

Tibia lead tertiles (µg/g)		OR (95% CI)
Model 1 <sup>a</sup>	< 6.5	Reference
	6.5-13	1.86 (0.44,7.95)
	13+	5.30 (1.42, 19.78)
	<i>P</i> for trend test	0.006
Model 2 <sup>b</sup>	< 6.5	Reference
	6.5-13	1.71 (0.39,7.44)
	13+	5.36 (1.36, 21.08)
	<i>P</i> for trend test	0.008
Model 3 <sup>c</sup>	< 6.5	Reference
	6.5-13	1.17 (0.24,5.68)
	13+	4.76 (1.25, 18.19)
	<i>P</i> for trend test	0.008
Model 4 <sup>d</sup>	< 6.5	Reference
	6.5-13	0.77 (0.12,4.98)
	13+	6.72 (1.62, 27.84)
	<i>P</i> for trend test	0.005

<sup>a</sup>Default model used for main analysis; adjusted for substudy group, age at bone lead measure, age at bone lead measure squared, year of birth, age at menarche, months of oral contraceptive use, parity, and pack-years of smoking; n = 434. <sup>b</sup>Same as model 1 plus additional adjustment for BMI and alcohol consumption; n = 411. <sup>c</sup>Same as model 1 plus additional adjustment for hormone replacement therapy; n = 423. <sup>d</sup>Same as model 1, but restricted to women with menopause after 1976; n = 401. *P* for trend was calculated using linear regression with a continuous lead biomarker term created by assigning each woman the median value of her lead biomarker tertile.